

REMARKS

Claims 1-22 are currently pending in this application. Reconsideration is respectfully requested in light of the above amendments and the following remarks.

The Examiner rejected claims 1-7 and 10-22 under 35 U.S.C §103(a) as being unpatentable over U.S. Patent Publication 2003/0204212 to Burnes et al. Applicants respectfully traverse this rejection.

Applicants' claimed invention as recited in independent claims 1, 15, 19 and 22 is directed towards a method and corresponding apparatus for determining displacement of an electrode. For example independent claim 1 recites a method comprised in part by determining a percent change of a sensed potential relative to a baseline potential and determining a change in an inter-electrode spacing between the first electrode and the second electrode based, at least in part, on the percent change of the sensed potential. (Underlining added for emphasis only). Applicants respectfully submit that Burnes et al. do not disclose or suggest the recited claim elements.

In maintaining this rejection the examiner admits that Burnes et al. do not disclose or suggest measuring inter-electrode spacing but instead measures impedance which is considered to be the ratio between the sensed voltage and current which the Examiner alleges is equivalent to the sensed potential. The Examiner further notes that Burnes et al. disclose that changes in electrode spacing can have significant impacts on impedance. The Examiner therefore argues that even though a distance calculation is not described, the suggestion as to the importance of the electrode distance in relation to impedance is enough motivation for consideration and derivation of such a parameter by one of skill in the art. Applicants disagree.

Applicants respectfully submit that Burnes et al. explicitly teach away from determining inter-electrode spacing (brought on by breathing) to adjust for the impacts of spacing changes on the impedance. Rather, Burnes et al. explicitly teach that impedance is a composite signal with a high frequency cardiac wave superimposed on a large amplitude low frequency breathing wave. Burnes et al. further disclose various

methods to take into account the breathing impedance change contribution. (Burnes et al., paragraph [0022]).

These methods measure impedance when the patient is supine with little movement and while the patient holds his or her breath or time the impedance measurement to occur near the inspiration peak or expiration nadir. Alternatively, Burnes et al. disclose that filtering can be used to remove the higher frequency cardiac impedance wave from the low frequency breathing component. (Burnes et al., paragraphs [0023]-[0026]).

Thus, Burnes et al. attempt to minimize the impacts of changes in electrode spacing on impedance by removing that component from the impedance measurement and in no way disclose or suggest that measuring changes in inter-electrode spacing would provide a better solution. The present invention on the other hand determines a percent change in potential to then determine the change in inter-electrode spacing in such a way that does not depend upon resistivity i.e. that eliminates the dependence on impedance, the exact opposite of what Burnes et al. disclose. (see Eq. 4, page 17, lines 22-30, of the subject specification).

Accordingly, Applicants respectfully submit that claims 1, 15, 19 and 22 are novel and non-obvious over Burnes et al. and are allowable. Applicants further submit that claims 2-7 and 10-14, claims 16-18, and claims 20-21 that depend from claims 1, 15 and 19 respectively are allowable as are claims 1, 15 and 19 and for additional limitations recited therein.

The Examiner rejected claims 8 and 9 under 35 U.S.C §103(a) as being unpatentable over Burnes et al. in view of U.S. 4,173,230 to Digby. Applicants respectfully traverse these rejections.

In view of the foregoing analysis of independent claim 1 over Burnes et al., Applicants believe that the rejection of dependent claims 8 and 9 under §103 is rendered moot as claims 8 and 9 depend from allowable independent claim 1. Applicant, therefore, requests withdrawal of the rejection of claims 8 and 9 under 35 U.S.C. § 103(a).

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In light of the above amendments and remarks, it is respectfully submitted that the application is in condition for allowance, and an early notice of allowance is requested.

Respectfully submitted,

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Date

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